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EXAMINER

LAFOND, RONALD D

ART UNIT

PAPER NUMBER

1792

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/796,473	Applicant(s) NGUYEN ET AL.	
	Examiner RONALD D. LAFOND	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The Amendments of December 18, 2007, were received and have been entered. Claims 1 – 4 and 6 are acknowledged as amended, and Claim 7 is acknowledged as cancelled. This Action is in response to amended Claims 1 – 6 and 8 – 20, which are currently pending.

Claim Objections

2. Claim 1 is objected to because of the following informalities: improper grammar. In line 4, the word "wherein" should be inserted before "the polymer composition"; in line 17 (the second to last line of the claim), the word "wherein" should be inserted before "the first". Appropriate corrections are required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 6 is vague and indefinite because laminating and casting are not coating methods. For examination purposes, the first instance of "coating" in the Claim will be interpreted by the Examiner to mean application method. Claim 6 is also vague and indefinite because, as amended, it recites an improper Markush group. See MPEP 2173.05(h).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 – 4, 6, and 8 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee, et al. (United States Patent Application Publication US 2002/0187401 A1, hereafter Lee1) in view of Lee, et al. (United States Patent Application Publication US 2004/0213985 A1, hereafter Lee2) and Hamer (United States Patent 4,620,956).

8. Regarding Claim 1, Lee1 teaches a method of making a composite microporous membrane (see Paragraph [0003]) comprising the steps of: a) coating a nonporous precursor film with a polymer composition (see Paragraph [0026]); and b) stretching the coated nonporous precursor, the stretching further comprising a first stretching conducted at a first temperature and a first stretching ratio, and a second stretching conducted at a second temperature and a second stretching ratio (see Paragraph [0112]). While Lee1 does not explicitly teach that the first and second stretching steps occur with first and second stretching rates, respectively, it is an inherent property of stretching steps that they occur with stretching rates; therefore, the limitations of stretching rates are inherently taught by Lee1.

9. Lee1 does not teach the limitations wherein a) the polymer composition in amended Claim 1 is selected from the group consisting of polyethylene, polypropylene, and polyester, and b) the first stretching rate is different than the second stretching rate.

10. Regarding the first limitation, Lee2 teaches many of the polymers cited in Paragraph [0032] of Lee1 as well as polyethylene, polypropylene, and polyester polymers (see Paragraph [0035]), which are coated onto a support layer of polyethylene and other polymer supports (see Paragraph [0034]) to form multi-component composite membrane for a battery separator (see Paragraphs [0003] – [0011]) in an analogous process to Lee1 (see Paragraphs [0012] – [0020]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Lee1 by coating the nonporous precursor film with a polymer composition selected from the group consisting of polyethylene, polypropylene, and polyester as taught by Lee2, because both Lee1 and Lee2 are teaching the production of microporous composite membranes for use in battery separators using similar processes and equivalent materials.

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11. Regarding the second limitation regarding stretching rates, Hamer teaches just such a limitation, wherein a first stretching is conducted at a first temperature and a first stretching rate, followed by a second stretching conducted at a second temperature and a second stretching rate, wherein the first and second stretching rates are different (see Column 11, lines 8 – 14, and Tables I – IV in Columns 7 and 8). Furthermore, both Lee1 and Hamer teach methods of producing microporous films from nonporous starting materials for use in battery separators (see Paragraphs [0003] – [0011] of Lee1 and Column 1, lines 5 – 68, and Column 2, lines 1 – 20, of Hamer), that the nonporous starting material comprises polyethylene (see Paragraphs [0026] and [0030] of Lee1, and Column 2, lines 34 – 37, and Column 5, lines 15 – 17 of Hamer), and that the first stretching step is a low temperature stretching step and the second stretching step is a high temperature stretching step (see Paragraphs [0044] – [0062] of Lee1 and Column 5, lines 15 – 48, of Hamer). Finally, Hamer teaches, in Column 11, lines 20 – 24, that “microporous ... films produced by the process of the present invention have greatly improved permeabilities with respect to microporous films produced by other processes.” Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Lee1 in view of Lee2 by utilizing a second stretching rate different from the first stretching rate as taught by Hamer to have obtained the advantage of improving the permeability of the microporous film as taught by Hamer.

12. Regarding Claims 2 – 4 and 8 – 19, Hamer teaches the method wherein the first stretching rate of 212 %/min is greater than the second stretching rate of 22 %/min, wherein the first stretching temperature of an ambient of 23 C (see Column 7, line 28, and Column 9, lines 19 and 59) is less than the second stretching temperature of 103 C, and wherein the first stretching ratio of 40 percent is less than the second stretching ratio of 129 percent (see Column 11, lines 8 – 13).

13. Regarding Claim 6, Lee1 teaches the method wherein coating consists of liquid coating/dipping and die coating, which is generic/inclusive of co-extrusion (see Paragraphs [0036], [0040], [0048], and especially [0063]).

14. Regarding Claim 20, Lee1 in view of Lee2 and Hamer does not explicitly teach the method wherein, prior to stretching, a second nonporous precursor is applied on said coating. It is the Examiner's

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position that it is within the purview of one having ordinary skill in the art to apply more than one coating or precursor layer in a composite to achieve a desired thickness, permeability, or other property. It would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Lee in view of Hamer by applying a second nonporous precursor on top of the polymer coating to provide a composite coating material of a desired thickness or permeability.

15. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee1 in view of Lee2 and Hamer, and further in view of Hasegawa, et al. (United States Patent 6,127,438, hereafter Hasegawa).

16. Regarding this Claim, Lee1 in view of Lee2 and Hamer does not teach the method further comprising the step of subsequently extracting a portion of the polymer composition from the stretched coated precursor. However, Hasegawa teaches just such a limitation, wherein a plasticizer is included in the formation of a membrane to achieve a suitable forming viscosity and influence porosity and pore size and is leached out after stretching (see Column 3, lines 16 – 28, Column 6, lines 26 – 67, and Column 7, lines 1 – 18). Furthermore, Hasegawa teaches, in Column 2, lines 54 – 67, that “the object of the present invention is to provide ... a polyethylene microporous film which is excellent in mechanical property, permeability and productivity and has both a sharp fuse effect and a high heat resistance which can assure the safety of batteries even under severe situations.” Lee1, moreover, teaches that the use of plasticizers in the production of such composite microporous membranes is known in the art (see Paragraph [0009] and [0010]). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to have modified the method taught by Lee1 in view of Lee2 and Hamer by using a plasticizer and removing it at a step subsequent to the stretching process to produce microporous membranes with excellent mechanical properties, permeability, and productivity, and sharp fuse effect and high heat resistance to improve battery safety as taught by Hasegawa.

Response to Arguments

17. Applicant's arguments filed on December 18, 2007, have been fully considered but they are not persuasive.

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18. The rejection to Claim 6 under 35 U.S.C. 112, 2nd Paragraph, has been maintained because the Amendments did not sufficiently clarify the conflict dealing with laminating and casting as methods of coating. While laminating and casting are methods of applying a layer to a substrate, they are not methods of coating.

19. On Pages 7 and 8 of Applicants' Remarks, Applicants state that "Claim 1 has been amended to distinguish the instant invention from the combination of Lee1 and Hamer ... "Accordingly, a difference between the claimed invention and the cited art is that the polymer coatings are different." A second secondary reference (Lee2) has been combined with Lee1 and Hamer to meet all the amended limitations of Claim 1.

20. In the second and third Paragraphs of Page 8 of Applicants' Remarks, Applicants argue that "the gel-polymer coating [of Lee] is essential to the manufacture of the particular battery being suggested ...", and that Hamer is directed to single layer membranes or membranes without coating. These arguments are not persuasive. In response to Applicants' arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In the instant case, Lee1 and Hamer are clearly analogous art, dealing with the art of making microporous membranes for battery separators. Lee1 alone discloses the general method claimed in Claim 1; Hamer teaches the benefits of certain stretching rates and ratios that are not explicitly taught by Lee1. Although Hamer does not teach a coated membrane, it does teach the concept of controlling the permeability of the film by stretching, so that one of ordinary skill in the art would have looked to Hamer to modify the porosity of the coated film of Lee1 to have achieved a united porosity between the film and substrate polymer layer, without an interface (see Paragraphs [0026] and [0068] of Lee1).

21. Finally, in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was

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made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the present case, Lee1 and Hamer are clearly analogous art teaching similar methods related to the production of microporous films for use in battery separators. Moreover, Hamer clearly teaches the benefits related to improved film permeabilities by using the two-step stretching process detailed therein, to solve the same problem that Lee1 discusses (in Paragraph [0026]).

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RONALD D. LAFOND whose telephone number is (571) 270-1878. The examiner can normally be reached on M - F, 9:30 AM - 6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197. If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. D. L./
Examiner, Art Unit 1792

/Frederick J. Parker/
Primary Examiner, Art Unit 1792